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ABSTRACT

This study traces the academic performance of the entering freshmen class of 1959 at the University of Arizona for 10 years. The objectives were to ascertain how many students succeeded in attaining a college degree at the University and elsewhere and to determine some of the relationships between various measures of scholastic performance and college attrition. Stated briefly, 23% graduated from the University in 4 years, and 3% graduated elsewhere in the same time. Another 18% of the total class graduated from the University within the next 6 years along with 8% who graduated elsewhere. An additional 2% were enrolled at the time the study was completed. In other words, 54% of the class received a baccalaureate degree within 10 years or were about to. A consistent trend was the positive relationship between measures of scholastic performance and college success. The probability of graduation was low for those students with poor scholastic records and high for those with strong records. Expressed in terms of high school class rank, the chances of graduating were more than twice as great for people from the top fifth of their high school classes as for those from the bottom fifth. (Author)

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Office of Institutional Studies
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A Study in Persistence: Attrition and Graduation Rates
at the University of Arizona

With rapidly rising enrollments and consequent increases in educational expenditures for higher education, concern is being expressed about admissions standards, institutional size, tuition, and other administrative and academic policies. One related area of specific concern to faculty, administrators, governing bodies of institutions and the public generally is the number of students who succeed in attaining a college degree, the percent who do not, and some of the contributing causes to success and failure. This report attempts to explore these particular questions at the University of Arizona.

The literature concerning retention and withdrawal of college students is extensive and has been dealt with from several points of view. The status of research has been reviewed by Knoell (1960)¹ and Summerskill (1962).² According to Knoell, there have been four major types of studies in this field. The most common is the census study that traces the academic performance of an entering freshman class for a period of time in order to establish some basic information about an institution. A second type is the autopsy study that seeks to identify reasons for attrition by asking students questions at the time of withdrawal. Some institutions conduct follow-up case studies of students judged to be marginal admissions. Finally, there are predictive studies in which admission variables are related to success and failure in college.

This is a census study of the freshman class of 1959. It describes what happened academically to this class over a ten-year period with special attention to the similarities and differences between students who remained in college and those who dropped out.

The classic study of this type was conducted by Robert Iffert in 1958.³ His study involved more than 12,000 students at 147 institutions. He found that fewer than 40 percent of the students from all types of institutions graduated in four years from the institution of first registration. Only 33 percent of the entering freshmen at public institutions graduated in four years. He estimated that perhaps as many as 60 percent of the entering freshmen eventually graduate from college. There were no significant differences in rates of graduation for men and women, and the heaviest attrition for all colleges took place during the freshman year. A review of studies performed at individual institutions indicates that these have been the general facts for several decades in American higher education.⁴

¹Knoell, Dorothy M. "Institutional Research on Retention and Withdrawal." H. T. Sprague (ed.), Research on College Students. Boulder, Colo.: The Western Interstate Commission for Higher Education, and Berkeley: The Center for the Study of Higher Education, 1960, 41-65.

²Summerskill, J. "Dropouts from College." N. Sanford (ed.), The American College. New York: Wiley, 1962, pp. 627-657.

³Iffert, Robert E. Retention and Withdrawal of College Students. U.S. Department of Health, Education and Welfare Bulletin, No. 1. Washington: United States Government Printing Office, 1958 No. 1, p.177.

⁴Summerskill, J. "Dropouts from College." N. Sanford (ed.), College & Character. New York: Wiley, 1964, p.188.

Some indication of change in these trends is evident in research showing the growing length of time taken to graduate⁵ or the comparative lower graduation rates of the increasing number of junior college transfer students.⁶

Persistence or attrition studies should not be compared, however, without a complete understanding of terms because of the equivocal nature of the subject. As one article points out, "estimates of the percentage of students who do not return to their college of matriculation after the freshman year vary from as low as four percent to as high as 51 percent depending on the reporting agency."⁷ Results differ significantly depending on the time span under consideration and upon the definitions of terms. A University of Illinois report reveals that over half of the males not in "continuous attendance," graduated within 10 years.⁸ One of the major inter-institutional studies defines a dropout as one who left before four or more years of college. Anyone leaving thereafter would not be considered a dropout. The report therefore shows a persistence rate of 65 percent.⁹ If the study had expressed persistence in terms of baccalaureate success it would have dropped to 54 percent.

In the University of Arizona study a non-dropout is defined as one who gets a baccalaureate or professional degree from the University of Arizona or elsewhere within 10 years from the date of matriculation. All other students are classified as dropouts except those currently enrolled at the time of the study. (No distinction is made between students who have withdrawn on a temporary basis and those who represent a permanent loss to higher education because such a division seems ambiguous and unnecessary for this study.)

The entering class of 1959 was studied for several reasons. It was recent enough so that the findings are relevant to the present, and at the same time a majority have already graduated. It was also necessary to go back far enough to allow a reasonable time for the graduation of part-time students. Even after ten years 33 part-time students were still in attendance as undergraduates. The 1959 class included 2082 new first-time freshmen. Part-time and foreign students have not been eliminated as they have been in some studies. The group also includes 60 holdovers from summer school. These are predominantly Tucson students who have gotten a slight head start. Finally, approximately 20 students who withdrew very early in the first semester were discarded.

The basic data used in the various analyses were obtained from two sources. Initially, the students' transcripts were reviewed to determine which students had sent transcripts of their records to other institutions. Lists of these 827 students were mailed to the 333 schools receiving transcripts along with a request for attendance information. The questionnaire also asked whether or not a degree had been awarded. Over 350 schools (92 percent) responded, and follow-up information was received on 791 students, or nearly 96 percent of the group. The rest of the students either dropped out or received degrees from the University of Arizona.

⁵Jex, F.B. and Merrill, R. M., "Student Persistence as Revealed in Longitudinal Graduation Studies," College and University, 1967, 42: 231-233.

⁶Trent, J. W. and Ruyle, J. H. "Variations, Flow and Patterns of College Attendance: The High School Graduate Study." College and University, 1965, 4, 61-76.

⁷Panos, Robert J. and Astin, Alexander W. "Attrition Among College Students." American Educational Research Journal, 1968, 5: 1, 57-72.

⁸Eckland, Bruce K. "College Dropouts Who Came Back," Harvard Educational Review, 1964, 34: 402-420.

⁹Panos and Astin, op. cit.

The students were followed until June of 1970, and were assigned to one of the following sub-groups at that time.

1. Those students who received a baccalaureate degree from the University of Arizona or were still in attendance.
2. Those students who received a baccalaureate degree from a school other than the University of Arizona, but who attended the University for at least one semester.
3. Those students who transferred elsewhere and did not finally get a degree and students who left the University of Arizona without further college or university attendance.

Most of the analyses in the study are concerned with the differences and/or similarities between these sub-groups. Each of the sub-groups is further divided by sex and comparisons are also made between the combined groups of graduates and non-graduates.

The variables used in the study relate primarily to academic achievement and not to the reasons for attrition.

The following is a listing of the data categories.

1. High school class rank
2. Number of years since high school graduation
3. Grade average at the University of Arizona
4. Number of units carried per semester at the University
5. Number of semesters attended at the University
6. Number of college transfers within the University
7. Number of probations, and disqualifications
8. Residence in terms of Tucson, the state of Arizona, and out-of-state
9. Type of degree earned at the University of Arizona or at other schools
10. The year of graduation
11. Types of schools attended by University of Arizona graduate students.

Findings

A summary of the degree completion and attrition rates of the 1959 class at the end of ten years is shown in Table 1. In contrast, Table 2 is a generalized model of national rates.

Graduation and Attrition Rates
University of Arizona

	Number Entering	Terminating before securing degree		Securing degree		Securing degree and terminating	
		No.	Percent	No.	Percent	No.	Percent
Entering College	2082						
Undergraduate attrition		961	46%				
Earning bachelor's				1121	54%		
Terminating education						686*	33%
Entering graduate school**	434 (21%)						
Master's attrition		176***	9%				
Earning master's				211	10%		
Terminating education						164	8%
Entering doctoral program	47 (2.3%)						
Doctor's attrition		35***	1.7%				
Earning doctor's				12	0.6%		
Terminating education						12	0.6%

*33 are currently enrolled.

**Includes students entering for first professional degrees.

***It is almost impossible to determine when a graduate student has terminated his studies. However, for the purpose of this study, those students who were not in attendance second semester 1970 are considered as having terminated.

TABLE 1

Graduation and Attrition Rates⁹
National Higher Education

	<u>Entering</u>	<u>Terminating before securing degree</u>	<u>Securing degree</u>	<u>Securing degree and terminating</u>
Entering College	100%			
Undergraduate attrition		47%		
Earning bachelor's			53%	
Terminating education				23%
Entering graduate school*	30%			
Master's attrition		11%		
Earning master's			19%**	
Terminating education				11%
Entering doctoral program	8%			
Doctor's attrition		4%		
Earning doctor's			4%	
Terminating education				4%

*Includes students entering for first professional degrees.

**The Carnegie Commission has evidently considered baccalaureate recipients who go directly for the doctorate as having achieved the master's degree.

TABLE 2

Although the categories within the tables are identical, a comparison between them is of limited validity and must be qualified. The data in Table 2 are basically estimates that include all four-year institutions of higher education, both public and private. No time span is specified, presumably it is unlimited.

⁹The Carnegie Commission on Higher Education, Less Time More Options, Education Beyond the High School, McGraw-Hill Book Co., January, 1971, p.9. This table exhibits "generalized data based upon degree statistics and available attrition studies."

Previous studies have found that rates vary with the type and control of the institution and that the longer the period under review, the greater the graduation rate. The graduate attrition figures by levels in Table 1 include currently enrolled students, and a portion of them will eventually secure degrees. The delayed graduation rate is particularly applicable to those within a doctoral program since it takes an average of eight years beyond the baccalaureate to achieve a doctorate. Despite these reservations, the total graduation and attrition rates are strikingly similar. The greatest difference is evident at the end of the undergraduate program. The University of Arizona has a larger percentage of students who terminate their careers and a smaller percentage who enter graduate school. The fact that the national figures reflect a more recent trend toward graduate enrollment probably has some influence on the results. The major difference occurs however because ten years is simply not a long enough time span in which to examine success or failure in acquiring an advanced degree. This is particularly so when doctorates are considered. The average number of years for obtaining a doctorate is twelve, counting from the freshman year in college.

Table 3 illustrates the variation in the length of time taken to achieve a bachelor's degree and how early students leave the University.

Undergraduate Attendance by Years of Completion

<u>Year</u>	<u>Bachelor's Degree Univ. of Arizona</u>	<u>Left University</u>	<u>Bachelor's Degree Earned Elsewhere</u>
1960	-	41.6%	-
1961	-	27.1	-
1962	2.6%	14.3	0.5%
1963	53.6	7.9	25.6
1964	22.5	6.4	30.3
1965	8.6	2.7	14.4
1966	4.4	-	11.5
1967	4.1	-	8.6
1968	2.4	-	1.9
1969	1.6	-	2.9
1970	0.2	-	4.3

Note: There are currently enrolled (1970) at institutions of higher education 33 students from the freshman class of 1959.

TABLE 3

The preceding table illustrates that the "normal" time to attain a college degree is more than four years. Approximately one-half of those who secured degrees took longer than four years. To summarize briefly, 23 percent of the freshmen who entered the University of Arizona ten years ago graduated in continuous progression, 3 percent graduated elsewhere in the same time. Another 18 percent of the total class graduated from the University within the next six years along with 8 percent who graduated elsewhere. The remaining 2 percent are currently enrolled.

The prolonged academic careers of some graduates can be explained by a few programs requiring five years such as architecture and pharmacy. The extended programs of others may represent curriculum changes, or interrupted studies for work or military service. In this connection it is interesting to note that 77.5 percent of the women graduates received their degrees after four years as opposed to 43 percent for the men.

Sex is not only related to the length of time taken to graduate but to the likelihood of getting a degree. Women obtain degrees faster, but men have the better record in obtaining degrees over a ten year period. Forty-five percent of the women eventually attained degrees versus 56 percent of the men. It is evident from this and the preceding analysis that when women drop out of college they are less apt to return than men. The reasons women drop out do not appear to have been purely academic, for as a group, they show higher academic aptitude and better grades than the men.

The 961 students who are classified as having left the University and not having completed a degree program represent primarily those who did not request transcripts be sent to other institutions, as well as a minor statistical correction for students for whom no data were received. There were 34 students for whom a reply was not received from other institutions. It is possible that a number of this group did obtain a degree; so an estimate has been made by distributing these people in the same pattern established by the total group.

Since there is a certain amount of cost involved in attrition, it is noteworthy that 42 percent of those who did not complete a degree left by the end of two semesters.

High School Class Rank

Academic readiness is the most obvious distinguishing characteristic between students who remain in college and those who drop out. The comparative qualifications of students in this study are discussed in terms of the standings in high school graduating classes. This measure is usually recognized as a better predictor of the probability of not dropping out of college than is one's standing on college placement or scholastic aptitude tests. Data pertaining to the graduation and attrition records of students graduating in various deciles in their high school classes are given in Table 4.

Completion of Undergraduate Studies by High School Class Rank

<u>Decile</u>	<u>No Degree</u>	<u>Currently Enrld.</u>	<u>B.A. at U. of A.</u>	<u>B.A. Elsewhere</u>	<u>TOTAL</u>
10	7.5%	9.7%	22.7%	20.3%	15.2%
9	9.5	6.5	19.6	12.8	14.0
8	13.6	9.7	16.9	15.1	15.1
7	14.9	12.9	11.6	16.3	13.6
6	17.3	12.9	10.7	10.5	13.8
5	13.6	12.9	7.9	10.5	10.9
4	9.4	3.1	4.8	4.6	6.9
3	6.7	16.1	2.4	4.6	4.8
2	5.1	6.5	2.4	4.1	3.9
1	2.4	9.7	1.0	1.2	1.8
Total	100%	100%	100%	100%	100%

TABLE 4

The probability of graduating from the University of Arizona is in approximately the same order as rank in high school graduating classes. The chances of graduating from the University or elsewhere are 20 percent greater for students who were in the top fifth of their high school class than for those who were in the second fifth of the high school class, and more than twice as likely as for those from the bottom fifth.

One-third of the students from the lowest quartile of their high school classes graduated while 54 percent of those above this level did so. This breakdown is of particular interest because from 1959 to 1969 the lowest quartile was used as an alternate cutting point for admission of in-state students to the University.

An analysis of high school class rank by sex reveals that the relationship between class standing and graduation is greater for men than for women. Seventy-seven percent of the men from the top fifth of their high school class as compared to 68 percent of the women achieved a baccalaureate degree.

Students who take from five to seven years to complete their undergraduate studies do not differ appreciably in academic aptitude from those who take four years.

University Grade Averages

Grade comparisons between groups of students differentiated on the basis of attrition and success in college are hampered by several considerations. Grade averages improve significantly with each succeeding class, and therefore comparisons between graduates and non-graduates must be confined to students within a particular class. Secondly, graduation averages are calculated differently from undergraduate cumulative averages¹⁰ so that if groups are to be contrasted, a standard system must be followed. In this study grade averages have been figured on the graduation average, i.e., grades in English and Math X have been eliminated along with failing grades in the freshman and sophomore years which have been repeated and established for credit in residence. Obviously some inequity remains, for the longer a student attends the university, the more likely he is to repeat a failed course.

¹⁰Up to 1969 the University followed a policy of forgiveness of successfully repeated failures during the lower division period in the computation of the graduation average.

Distribution of Cumulative Grade Averages
for Graduates and Non-Graduates

Cumulative Semesters Attended	Students in Attendance at U. of A.	CUMULATIVE GRADE AVERAGES				
		0.0-1.5	1.51-2.5	2.51-3.5	3.51-4.5	4.51-5.0
0.0-2.0	1039 Graduates	4.3%	29.8%	55.8%	2.6%	.5%
	856 Non-Grads.	.8	10.0	44.0	34.0	11.2
2.5-4.0	947 Graduates	3.5	33.3	59.0	4.2	.0
	490 Non-Grads.	.0	11.6	52.9	32.2	3.3
4.5-6.0	890 Graduates	3.7	36.5	58.1	1.7	.0
	274 Non-Grads.	.4	12.8	60.2	25.9	.7
6.5-8.0	837 Graduates	4.1	42.5	52.6	.8	.0
	151 Non-Grads.	.0	14.6	61.6	23.1	.7
8.5-10.0	471 Graduates	2.1	34.0	63.3	.6	.0
	78 Non-Grads.	1.3	11.5	69.2	18.0	.0

TABLE 5

A consistent trend evident from the table is that students who eventually receive degrees have substantially higher grade averages than those who drop out. The disparity between the groups reaches a peak by the end of eight semesters when 47 percent of the graduates have averages of 2.50 and above as opposed to 15 for the non-graduates. Both groups show a steady improvement in their grade distributions over this period. For example, the portion of non-graduates with averages of 3.51 and below drops from above one-third at the end of two semesters to less than one-fourth after eight semesters. In the case of the graduates the gain in averages results primarily from better grades. The change in the averages of non-graduates, on the other hand, is influenced more by the higher attrition rate of students with low grade averages.

A separate analysis of the performance of degree students indicates that those who graduated from the University had higher averages than students who achieved degrees elsewhere. This suggests that the University tends to hold its better students while those with less academic ability either transfer to other schools or leave school altogether. Those students who transfer from the University and receive degrees at a subsequently attended school have higher academic records than those students who transfer but do not eventually complete a degree.

In all instances where scholastic achievement is measured, women score higher than men on the average. In fact, there are proportionally more grade averages of 2.50 and better among the entire women's group than among the subgroup of men graduates for each of the semester ranges. The superior achievement of women is a common situation that has been demonstrated by numerous studies and is attributed to better adaptation to educational institutions, stronger motivations and a heightened sense of responsibility.

The comparative performance of graduating and non-graduating students involves both the quality of their academic achievement and other factors associated with attaining a degree, such as course loads and interruptions.

These questions are related because unsatisfactory grades may delay the completion of degree requirements, and interruptions may have an adverse effect upon grades.

The number of semesters attended, the average number of units carried, the number of college transfers within the university and the incidence of probation and disqualification are classified by Knoell and Medsker as "cost factors." Their definition of this term illustrates the need for such analyses.

"The concept of 'cost' is believed to be somewhat appropriate in this instance since prolonged enrollment at the undergraduate level is expensive to the student, in terms of reduced earning power, to his family, if he continues to be financially dependent, and, in the case of the public colleges, to the state which must provide opportunity for the rapidly increasing numbers of high school graduates who plan to attend college. Earned units which are greatly in excess of the number usually required for a baccalaureate degree could also be viewed as an unnecessary burden to the taxpayer, particularly when earned in colleges where costs are borne almost entirely by the state."¹¹

Semesters Attended

Comparative patterns of attendance at the University are summarized in Tables 6 and 7. The patterns pertain to the number of semesters the students attended the University. Not indicated are the number of semesters taken at other institutions nor whether the semesters are in continuous succession. In other words, the tables show only the total number of semesters at the University.

Semesters Attended by Graduates at the University of Arizona

Degree Awarded	SEMESTERS ATTENDED						Total
	0.0 -2.0	2.5 -4.0	4.5 -6.0	6.5 -8.0	8.5 -10.0	Over 10.	
1962	0	0	3	14	5	0	22
1963	0	0	9	191	241	21	462
1964	0	0	4	14	97	79	194
1965	0	0	0	2	20	52	74
1966	0	0	1	0	6	31	38
1967	0	0	0	0	8	27	35
1968	0	0	1	0	4	16	21
1969	0	1	0	1	3	9	14
1970	0	0	0	0	0	2	2
Subtotal	0	0	18	222	384	237	862
Percent	0	.1%	2.1%	25.8%	44.6%	27.4%	100%
Degree awarded elsewhere	96	71	23	11	0	3	208

Note: Combined summer sessions of 8 or fewer units are recorded as half semesters. Students still in attendance are not included in this table.

TABLE 6

¹¹ Knoell, Dorothy M., and Medsker, Leland L., Factors Affecting Performance of Transfer Students from Two- to Four-Year Colleges. Cooperative Research Project No. 1133, University of California, 1964, p. 146.

Tables 3 and 6 create different impressions of the graduation rates of university students. If the rates are viewed in terms of calendar years, as in Table 3 (see page 6), the breakdown suggests that the students are going to school for an unusual length of time. Table 6, however, shows that 72.6 percent of the students graduate within 10 semesters. This is modified by the fact that this study does not show the number of semesters attended at other institutions.¹²

An investigation of those students who took longer than 10 semesters to graduate reveals that over four-fifths of them were men who came predominantly from the lower half of their high school graduating class and generally had low grade averages. An unexpected finding was that as a group they carry approximately the same average number of units per semester as those who graduated earlier.

Nearly half of the students who graduated elsewhere left by the end of two semesters, and over 80 percent left by the end of four semesters.

Table 7 examines by class rank the number of semesters that non-graduates stayed at the University.

Semesters Attended by Non-Graduates
by High School Class Rank

Semesters Attended	High School Class Rank			
	TOP HALF		BOTTOM HALF	
	Number	Percent	Number	Percent
0.0 - 2.0	214	41.7%	117	38.3%
2.5 - 4.0	143	27.8	81	26.6
4.5 - 6.0	72	14.0	45	14.8
6.5 - 8.0	35	6.8	33	10.8
8.5 -10.0	33	6.4	23	7.5
10.5 and over	17	3.3	6	2.0
	514	100%	305	100%

Note: High school class ranks were not available for all students.

TABLE 7

Three observations on the table are noteworthy. Although a larger absolute number of students from the top half failed to graduate than from the lower half, this was proportionally fewer of the total students from the top half than the number from the bottom half. In other words, 61 percent from the bottom half failed to graduate as opposed to 40 percent from the top half. It is evident

¹²Transcripts record only units accepted for transfer. A sample survey reveals that approximately one-quarter of the students earned three or more units at another institution and that 65 percent of these students earned from 3 to 15 units.

that the greatest number of students failed to return after two semesters. One would expect students from the top half of their high school class to persist longer than those from the bottom half but there does not appear to be a strong relationship between the length of time a non-graduate stays and his academic aptitude as measured by high school class rank. This is probably true for a number of different reasons. Financial, family, and personal problems are obviously common to students in both halves of high school classes.

Academic Course Load

There is a strong relationship between the average number of units carried per semester and the length of time taken to graduate. There is a somewhat less pronounced relationship between average course load and the likelihood of securing a degree. Both trends are illustrated by the distributions of the average semester units for a variety of student groups.

Distribution of Average Student Course Loads

Selected Groups	AVERAGE UNITS* COMPLETED PER SEMESTER					Total
	0 - 6	7 - 10	11 - 13	14 - 16	17 & over	
1963 Graduates	0%	0%	11.3%	78.4%	10.4%	100%
1964 Graduates	.5	.5	29.9	63.4	5.7	100%
1965 Graduates	0	9.5	48.6	39.2	2.7	100%
Graduate Men	.6	3.0	24.6	62.0	9.8	100%
Non-Grad. Men	4.1	17.7	31.2	40.0	7.0	100%
Graduate Women	0	2.3	18.1	73.0	6.6	100%
Non-Grad. Women	3.2	10.5	29.4	52.8	4.1	100%

*Credits not included are first repeat courses, English and Math X, credits earned by examination, military service credit, and extension or correspondence credit.

TABLE 8

Students who fail to complete a degree clearly earn fewer units on the average than those who graduate. The comparatively wide range of their average course loads, however, suggests that there might be a relationship between the number of units earned and the number of semesters in attendance. The assumption would be that the fewer the number of semesters, the smaller the average number of units. Table 9 shows that this does not hold true to an appreciable extent. Over half of the students who earned six units or less left by the end of two semesters. Nevertheless these 24 people constitute only 4.5 percent of the people who left within this period.

Units Completed, by Semesters Attended

Units Completed	SEMESTERS ATTENDED					
	0.0 - 2.0	2.5 - 4.0	4.5 - 6.0	6.5 - 8.0	8.5 - 10.0	10.5 & over
0-6	4.5%	2.7%	1.5%	.7%	.5%	0.0%
7-10	8.3	11.5	10.8	5.0	3.8	18.3
11-13	20.4	25.4	35.5	12.3	30.5	56.5
14-16	55.4	54.7	46.8	72.0	61.3	24.6
17 & over	11.3	5.7	5.4	10.0	3.8	.5
Total	100%	100%	100%	100%	100%	100%

TABLE 9

College Transfers

It is also interesting to look at graduation rates in relation to the frequency with which students changed colleges within the University before finally graduating or leaving. This does not include changes in major such as a switch from electrical engineering to mechanical engineering. Of the students who graduated from the University 55 percent made at least one change from the college they chose as entering freshmen.¹³ Non-graduates showed far lower rates of change chiefly because of the shorter periods of attendance. Comparable change percentages for those students who left within one year were 13 percent; two years, 34 percent; and three or more years, 47 percent.

If students are grouped by the number of changes without regard to graduation and viewed in terms of high school class rank, it is evident that students with higher ranks make proportionally more college changes. Over three-fourths of those who made two, three, or more changes graduated from the top half of their high school classes. These comparisons suggest that a flexible university curricula, within which students can change educational goals, is conducive to the needs of bright students.

Incidence of Probations and Disqualifications

An additional measure of cost or the relative efficiency of degree progress is the incidence of probations and disqualifications at the University. Besides reflecting poor scholarship, these measures give some indication of the amount of special academic attention required for different groups of students.

¹³Approximately 25 percent of these changes were made to the Colleges of Education and Pharmacy, both of which require preliminary credit in other colleges.

Number of Semesters on Scholastic Probation

<u>Semesters on Probation</u>	<u>Graduates*</u>	<u>Non-Graduates</u>	<u>Total</u>
None	82.2%	58.8%	70.8%
1	6.2	22.1	14.0
2	2.9	8.2	5.5
3	2.3	3.8	3.0
4-6	3.5	4.7	4.1
7 & over	<u>2.9</u>	<u>2.4</u>	<u>2.6</u>
	100%	100%	100%

*Graduates from the University and elsewhere have been combined since their rates are nearly the same.

TABLE 10

More than twice as many of the non-graduates were on probation as those who graduated. This suggests that the probationary warning system, although not completely foolproof, is functioning as it was intended as a rough predictor of success in obtaining a degree.

Incidence of Disqualification

<u>Number of Disqualifications</u>	<u>Graduates</u>	<u>Non-Graduates</u>	<u>Total</u>
None	56.6%	43.4%	100%
1	18.2	81.8	100%
2	6.3	93.7	100%
3	12.5	87.5	100%
4	0	100.0	100%

TABLE 11

Non-graduates constitute 46 percent of the class and account for 84.5 percent of the total disqualifications. Again, there is only a slight difference in the incidence of disqualification between the students who graduated from the University as opposed to those who graduated elsewhere.

Geographical Origin

The following table analyzes the performance of students from Tucson, Arizona communities other than Tucson, and from out of state.

Selected Measures of Academic Performance
for Students by Residence (by percent)

Performance Measures		Tucson	Other Ariz.	Out of State
Ranked in top half of high school class	Men	58.4%	78.2%	61.6%
	Women	80.6	88.8	75.6
	Total	67.7	81.0	68.6
Average course load of less than 14 units		Total	52.0%	28.0%
				29.0%
Received Bachelor's degree at University of Arizona	Men	48.6%	51.6%	38.7%
	Women	43.9	45.5	28.0
	Total	46.6	49.5	33.5
Withdrew finally by end of two semesters	Men	19.5%	15.4%	28.0%
	Women	20.7	15.7	34.1
	Total	19.9	15.5	30.7
Received Bachelor's degrees anywhere	Men	54.0%	60.0%	55.8%
	Women	46.4	53.3	41.1
	Total	50.8	57.7	48.6

TABLE 12

When persistence is measured in terms of full withdrawal¹⁴ after two semesters (not necessarily consecutive semesters, but generally so) a greater percentage of students from other Arizona communities persevered than did Tucson students. Out-of-state students fared most poorly with nearly double the final withdrawal rate that non-Tucson students experienced. This is so because out-of-state students must pay more for each semester of education than Arizona students. When economic risk is high, academic chance-taking tends to be lower. The combination of out-of-state tuition, room, and board discourages students with poor records from remaining in school. Many such students return to their own state universities to lessen the economic risk of additional education. This reaction is suggested when the baccalaureate success of out-of-state students at the University of Arizona is compared with their success in obtaining a degree both here and elsewhere. Although only one-third of them received bachelor degrees at the University of Arizona, forty-nine percent eventually obtained them at some institution.

There is a marked difference in the success of men and women in obtaining bachelor's degrees from the University of Arizona or, for that matter, from any institution. Despite the fact that a much larger percentage of women than men were ranked in the top half of their high school classes, women had much less success in obtaining an undergraduate degree. This was the case regardless of whether the women were from Tucson, other Arizona communities, or out of state. It appears in general the academic careers of women are much more dispensable than those of men.

¹⁴Final in terms of the ten years studied.

For women there was much less relationship between high school rank and obtaining a baccalaureate degree than there was for men. Women in the top three deciles of the high school class had the greatest success. In deciles below these there was little relationship.

At the end of four years, out-of-state students had the highest dropout rate. Arizona students from communities other than Tucson had the next highest rate with Tucson students showing the least dropout over a four-year period. This reaffirms the contention that dropout rates tend to be higher for those groups with greater dollar investments in education.

Students from Arizona communities other than Tucson had the best success in obtaining a degree. Students from out of state had the least. Tucson students fell somewhere between. Since out-of-state students rank on the average higher in their high school classes than Tucson students, it should be expected that their success in obtaining a degree would be greater. This was not the case. Forty-nine percent of out-of-state students eventually obtained a baccalaureate somewhere while 51 percent of Tucson students obtained one. Arizona students from areas outside of Tucson consistently show the highest grade averages throughout their academic careers.

Percent of Grades 2.5 and above for Students,
by Residence and Semesters Attended

Semesters Attended	Tucson		Other Ariz.		Out-of-State	
	Men	Women	Men	Women	Men	Women
1 - 2.0	18.4%	35.4%	21.1%	38.1%	17.6%	24.9%
2.5 - 4.0	21.5	45.1	23.4	44.4	18.9	32.1
4.5 - 6.0	23.9	57.1	25.2	56.8	23.8	40.7
6.5 - 8.0	31.5	66.2	31.6	70.5	27.7	55.0

TABLE 13

Despite the higher over-all academic performance of women shown in Table 12, their withdrawal rate at the end of two semesters is higher than males, and their over-all success in obtaining a bachelor's degree anywhere is significantly lower than males. Table 13 also shows this same pronounced difference between the academic performance of men and women. It is interesting to speculate about the reasons for this. Certainly a strong factor is the greater emphasis on the male as the wage earner. Given both a son and daughter in the university, a family is more apt to try to keep a son in school under difficult financial conditions than a daughter. When two students marry, the wife is more apt to work and keep the male in school than the reverse.

Year of High School Graduation

Generally students who enter college immediately from high school have a slightly better graduation record than those who postpone enrollment two or three years. In 1959 eighty-nine percent of the new first-time freshmen graduated from high school during the same year. After three years postponement the success rate of students climbed dramatically. This may be a result of the developing

maturity of these students brought on by work, marriage, or army experience; however, the number of students who enrolled four or more years after graduation is much too small to allow any firm conclusions to be drawn about the group.

Year of High School Graduation

<u>Year</u>	<u>Percent of Freshman Class</u>	<u>Percent of High School Class Obtaining Degrees</u>
1959	89.1%	52.6%
1958	4.2	40.2
1957	1.6	30.3
1956	.8	31.2
1955	1.4	55.2
1954	2.7	42.9
More than 5 years	.2	60.0
	100%	

TABLE 14

It is obvious from this table that the greatest proportion of first-time freshmen are directly out of high school with 11 percent having deferred registration from one to five years. Seventy-seven percent of the 226 students enrolling from high school classes earlier than 1959 were males. This strengthens the contention that males as the breadwinners feel much greater pressure to obtain a college education than do women.

Graduate Students

The study to this point has been concerned primarily with the distinctions between those who complete a bachelor's degree as opposed to those who do not. It remains to examine some of the characteristics of the 434 members of the class who went on for advanced study. As of February 1970, the class could claim 29 lawyers, 15 doctors, 167 master's degrees, 12 doctorates and 47 people who were enrolled and working toward advanced degrees that particular semester. A more detailed description of the advanced academic status of the class at this time is shown in Table 15.

Academic Status of Those Admitted for
Advanced Study as of February, 1970

	<u>First Prof.</u>		<u>Master's</u>		<u>Doctorate</u>		<u>Total</u>
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	
Admitted and currently enrolled at U. of A. or elsewhere	1	0	14	14	11	7	47
Admitted and not currently enrolled	21	3	48	75	11	6	234
Degree from U. of A.	27	1	57	31	2	1	119
Degree from elsewhere	16	0	55	24	9	0	104
Total	65	4	174	144	33	14	434

TABLE 15

The categories used to define the status of graduate students should not be confused with those used with regard to undergraduate students. Currently enrolled graduate students, for example, are more likely to complete their degree than currently enrolled undergraduates. As a group, the graduate students have substantially higher aptitude, more demonstrated ability and motivation and many are enrolled in long-term programs. Even those within the "admitted and not currently enrolled" category have not necessarily terminated their academic careers. A portion of the group could easily have been out of school the particular semester the study was terminated. This could apply to teachers, graduate students engaged in research or others who temporarily interrupted their programs for work or military service.

Men outnumber women by a ratio of 1.7 to 1 which is higher than the undergraduate ratio of 1.3 to 1. Nationally at public universities there are over twice as many men as women enrolled for master's and doctoral degrees.¹⁵

Graduate students are a highly selected group, with better academic histories on the average than other bachelor's degree holders and markedly better than the class as a whole. One-half are from the top fifth of their high school graduating classes as opposed to 29 percent for the entire class and 40.6 percent for baccalaureate holders.

Graduate Students by High School Class Rank

Decile	Professional	Master's	Doctor's	Total	
				Number	Percent
Highest	14	86	17	117	30.5%
9	13	56	7	76	19.8
8	10	51	5	66	17.2
7	4	23	3	30	7.8
6	9	27	2	38	9.9
5	5	18	1	24	6.3
4	2	8	0	10	2.6
3	4	7	2	13	3.4
2	1	5	0	6	1.5
Lowest	1	2	1	4	1.0
Subtotal	63	283	38	384	100%
Unranked	6	35	9	50	
TOTAL	69	318	47	434	

TABLE 16

¹⁵Students Enrolled for Advanced Degrees, Institutional Data, Fall 1969, National Center for Educational Statistics, OE-54019-69-Part B, Table 1, p. 5.

Graduate students also achieve the highest undergraduate grade averages. Nearly two-thirds of them had graduation averages of 2.50 and above while 29 percent of the entire class and 46 percent of the graduates had similar averages.

Distribution of Undergraduate Cumulative Grade Averages
for Graduate Students

	UNDERGRADUATE GRADE AVERAGES			Total
	0.0 - 1.5	1.51 - 2.5	2.51 - 3.5	
Professional	2	31	36	69
Master's	29	183	106	318
Doctorate	7	29	11	47
Total	38	243	153	434
Percent	8.76%	56.00%	35.24%	100%

TABLE 17

It is not possible in this study to give the reasons graduate students chose to attend particular institutions. They might have sought admission to schools with outstanding reputations in certain fields, or they might have wanted to attend schools that were conveniently located. It is possible, however, to indicate the type of institution to which they were admitted. Table 18 uses the United States Office of Education classifications of institutions.

Highest Level of Offering of Most Recent Institution Attended

	Number	Percent
Two but less than 4 years	2	.49%
Four- or 5-year baccalaureate	1	.24
First professional degree	4	.97
Master's	19	4.61
Beyond master's but less than doctorate	8	1.94
Doctorate	170	41.26
University of Arizona	208	50.49
Subtotal	412	100%
No information	22	
Total	434	

TABLE 18

About half of the graduate students continued their studies at the University of Arizona while the majority of the remainder attended other Ph.D.-granting institutions. Less than 10 percent of the graduate students attended institutions granting degrees below the doctorate.

Conclusion

This report has afforded some answers to questions associated with succeeding and dropping out of the University of Arizona. The primary purpose of the study has been to determine some of the relationships between various measures of scholastic performance and college attrition.

A positive relationship between measures of scholastic performance and college success was a consistently noted trend. The probability of graduation was low for those students with poor scholastic records and high for those with good records. This finding was expected and proved particularly true at the extremes. Expressed in terms of high school class rank, the chances of graduating were more than twice as good for students from the top fifth of their high school graduating classes as for those from the bottom fifth. After two semesters 67 percent of bachelor's holders had the minimum university graduation average of 3.0 or higher as opposed to 28 percent for the non-graduates. It must be borne in mind, however, that one-third of the students from the bottom fifth of their classes received a degree and that one-third of those who obtained degrees had cumulative grade averages below 3.0 after two semesters. The latter results suggest that the relationship between baccalaureate success and prediction of scholastic performance are probably a function of internal and external motivational factors as well as of aptitude and ability.

A second finding concerned sex difference in academic achievement. Women placed higher on all measures of scholastic performance than men, with the exception of the percentage achieving a degree. Although the generally better academic records of women would favor higher graduation rates, this is not the case in the long run. Women apparently have different motivations toward academic endeavors. Women probably leave school for reasons other than those that cause men to leave. Having left school, they are less likely to return.

How early students leave college if they do not obtain a degree is interesting for a number of reasons. Since there is a certain amount of "cost" involved in attrition, it is significant that 42 percent of those who did not eventually complete a degree left by the end of two semesters. Secondly, those students who were successful at other colleges or universities were those who persisted longer at the University as compared to the students whose attrition was final. If non-graduating students prolonged their academic careers, they might constitute an impediment to the inflow of new students. This is particularly the case in departments, colleges, or institutions where enrollment is limited. This does not appear to have been the case with the entering class of 1959. The proportion of students who remained on marginal academic status was not as great as might have been assumed. The improvement in average grade averages between freshman, sophomore, junior and senior classes is more a matter of the attrition of the less academically able than the improvement of those who remain.

Although it is now generally acknowledged that the "normal" time to earn a college degree exceeds four years, this should not necessarily be interpreted to mean that students are accumulating an excessive number of units or that they are carrying lighter loads. Brighter students, or those more likely to graduate, compile a greater total number of academic units and carry heavier semester course loads than less able students. Viewed in terms of semesters attended, 73 percent of the baccalaureate recipients graduate by the end of 10 semesters, or after five years. This suggests that more and more students are taking a semester or a year off to earn money or supplement their education with practical experience between the time they enter as freshmen and the time they earn a baccalaureate degree. Studies of student course loads reveal that if anything, students are taking on the average slightly more units per semester.